



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE  
GOVERNOR

EUGENE A. CONTI, JR.  
SECRETARY

MEMORANDUM TO: Project Engineers  
Project Design Engineers

FROM: G. R. Perfetti, PE  
State Structures Engineer

DATE: December 21, 2011

SUBJECT: END BENT CAP DEPTH

In order to decrease bridge length and reduce cost, the minimum depth of end bent caps for all bridge types shall be increased from 2'-6" (760 mm) to 4'-0" (1.22 m). In addition, the top of berm shall be located 1'-0" (300 mm) above the bottom of cap. The minimum pile embedment for 4'-0" (1.22 m) end bent caps has increased to 2'-0" (610 mm). See Figure 7-23a for details.

Use Figure 7-15a when computing the required wing length. The minimum wing length, measured from the fill face, is 7'-0" (2.13 m). Use Figure 7-19 to determine the steel reinforcement and use the details shown in Figure 7-13a to develop the contract plans. Refer to Figure 7-19 to determine if a wingwall brace pile is required. When required, detail the brace pile one-third ( $\frac{1}{3}$ ) of the length from the end of the wingwall. See Figure 7-16a for details.

When 4'-0" (1.22 m) caps are not feasible, e.g. for low water bridges or locations where excavating or raising the grade is not prudent or economical, 2'-6" (760 mm) end bent caps may be used. Detail the berm 1'-6" (450 mm) above the bottom of cap and show the piles embedded 1'-0" (300 mm) into the cap.

This policy is effective for all new projects. Investigate the feasibility of using 4'-0" (1.22 m) caps on existing projects on a case-by-case basis. The Cored Slab Standard Design Plans and Standard Drawings have been updated. Chapter 7 of the online version of the Design Manual will be updated at a later date. In addition, the following new figures have been developed for use with 4'-0" (1.22 m) end bent caps:

Section	Comment
11-1a	Stream Crossing Details (Cored Slab bridges with for 4'-0" end bent caps)
11-2a	Stream Crossing Details (Bridges with a backwall on 4'-0" end bent caps)
11-3a & 11-3b	Stream Crossing Details (Used in conjunction with Figs. 11-1a or 11-2a)
12-22a	Rip Rap Details (for 4'-0" end bent caps)
12-23a	Concrete Slope Protection (for 4'-0" end bent caps)

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Project Engineers  
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Figure 6-1 has been updated for consistency with Figures 11-3 and 11-3a.

GRP/BCH/GM/gdt

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